DEPARTMENT OF PLANNING AND BUILDING
MULTI-FAMILY BUILDING CHECKLIST

City Staff has compiled this partial checklist to assist developers designing buildings in conformance with the present edition of the building code. The City of Long Beach assumes no liability or responsibility for the accuracy or completeness of information presented herein. Please note: Numbers in brackets are in reference to sections of the 2001 CBC.

BUILDING OCCUPANCY AND AREA

1. Exterior walls shall have fire resistance and opening protection as set forth in Table 5-A and additional provisions set forth in Chapter 6 [503.2.1].

2. Openings in exterior walls are required to be protected due to distance from property lines, the sum of the area of these openings shall be limited to 50% of the area of the exterior wall in each story [503.2.2].

3. Occupancy separations shall be provided between the various groups and divisions of occupancies as set forth in Table 3-B [302.1, 302.4]

4. Where the occupancy separation is horizontal, structural members supporting the separation shall be protected by equivalent fire-resistive construction [302.2].

5. R-1 Occupancy buildings more than two stories in height or having more than 3,000 square feet of floor area above the first story shall not be of less than one-hour fire-resistive construction throughout [310.2.2].

6. Walls and floors separating dwelling units in the same building, or guest rooms in Group R-1 Occupancies shall not be of less than one-hour fire-resistive construction [310.2.2].

7. Buildings or parts of buildings classed as U-1 Occupancies shall not exceed 1,000 square feet in area or one story in height [312.2.1].

8. The total area of a private garage (U-1 Occupancy) may be 3,000 square feet provide the following provisions are satisfied [312.2.2]:
   a. For mixed-occupancy building, the exterior wall and opening protection for the Group U-1 portion of the building shall be as required for the major occupancy of the building.
   b. For buildings containing only Group U-1 Occupancy, the exterior wall and opening protection shall be as required for a building classified as Group R-1 Occupancy.

9. For the purpose of area limitation, limitation on the number of stories and type of construction, a basement or first story may be considered as a separate and distinct buildings if the following conditions are met [311.2.2.1]:
   a. The basement or first story is of Type I construction and is used exclusively for parking.
   b. The basement or first story is separated from the building above with a three-hour occupancy separation.
   c. The portion of the building above the three-hour occupancy separation contains A-3, B, M or R-1 Occupancies only.
   d. The maximum building height shall not exceed the limits set forth in Table 5-B for the least type of construction.

10. The area of a building housing more than one occupancy shall be such that the sum of the ratios of the actual area for each occupancy, divided by the total allowable area does not exceed one [504.3].

11. Area increase provisions due to sprinklers shall not be used when sprinklers are used for increase in number of stories or substitution for one-hour construction [505.3].

12. Area separation walls shall extend to the outer edges of horizontal projections such as balconies, roof overhangs, canopies or other architectural projections [504.6.3].

13. Unless the roof is of two-hour construction, area separation walls shall extend from the foundation to a point at least 30” above the roof [504.6.4].
14. A fire assembly having a three-hour fire-protection rating shall protect openings in four-hour area separation walls and a fire assembly having a one-and one-half-hour fire-protection rating shall protect openings in two-hour area separation walls. Openings shall be limited to 25% of the length of the wall in each story [504.6.2].

15. Wall rating and opening protection of buildings on the same property and court walls of buildings over one story in height shall be determined based on an assumed property line between them [503.3].

ARCHITECTURAL PLANS (GENERAL)

1. Architectural plans shall include the following:
   a. Complete plot plan showing yard setbacks, easements, lot dimensions, distances between buildings, size of building, etc.
   b. Fully dimensioned floor plan of each level
   c. Roof plan
   d. Foundation plan
   e. Construction sections
   f. Building elevations. Floor and top of roof elevations, natural and finished grade around the perimeter of the building.
   g. Architectural details
   h. Door/window schedule
   i. Address of the building, the name and address of the owner(s), and of the person(s) preparing the plans.

2. Building design shall comply with construction codes adopted by the City of Long Beach: 2001 edition of the California Building Code, California Mechanical Code, California Plumbing Code, California Electrical Code and Title 18 of the Long Beach Municipal Code (LBMC).

3. Plans shall be quality blue or black ink line drawings with uniform light background color, 24”x 36” in size, stamped and signed by the responsible architect or engineer designing the project.

4. Airborne and impact sound wall and floor-ceiling assembly between dwelling units and from public areas such as interior corridors, garages and mechanical areas shall be identified and detailed [1208 Division II].

5. Penetrations into sound rated assemblies shall be sealed, lined, insulated with an approved permanent sound insulation material [1208.2 & 1208.3 Division II].

6. Parking garages shall have an unobstructed headroom clearance of not less than 7’ above the finish floor to any ceiling, beam, conduit or similar obstruction [311.2.3.3].

7. In parking garages where any parking area is located more than 5’ above the adjacent grade, vehicle barriers shall be provided [311.2.3.5].

8. Projections beyond the exterior wall shall not extend beyond:
   a. A point one third the distance to the property line from an assumed vertical plane located where fire-resistive protection of openings is first required due to location on property [503.2.1]; or
   b. More than 12” into areas where openings are prohibited [503.2.2].

9. A-3 Occupancies located in a basement or above the first floor shall not be of less than one-hour fire-resistive construction [303.2.2.2].

10. Assume a property line between buildings on the same property and between court walls of buildings over one story in height to determine exterior wall rating and opening protection [503.3].

11. Mezzanine shall comply with area limitations, extent of enclosure and exit requirements of [507].

12. Unenclosed floor and roof openings, open and glazed sides of stairways, landings, balconies or porches, which are more than 30” above grade, or floor below, shall be protected by a guardrail. Guardrails shall be not less than 42” in height [509.1].

13. Open guardrails shall have intermediate rails or an ornamental pattern such that a sphere 4” in diameter cannot pass through [509.3].

14. Fire dampers shall be provided in the following locations (show dampers on the mechanical plans) [713.11]:
   a. Penetrations through area and occupancy separation walls.
   b. Penetrations of shaft enclosures.
   c. Penetration of fire resistive construction of corridors.

d. Penetrations of the ceiling of fire resistive floor-ceiling or roof-ceiling assemblies.
e. Penetrations of an atrium enclosure element.
f. Penetrations of the building exterior walls required to have protected openings per Section 503.
g. Penetrations of areas of refuge.

15. Smoke dampers shall be installed in the following locations (show dampers on the mechanical plans) [713.10]:
    a. Penetrations of area or occupancy separation walls.
    b. Penetrations of shaft enclosures.
    c. Penetrations of fire resistive construction of corridors.
    d. Penetrations of smoke barriers.
    e. Penetrations of elevator lobbies required by Section 403 or 1004.3.4.5
    f. Penetrations of areas of refuge.

16. In combustible construction, fire blocking shall be installed in the following locations: [708.2.1].
    a. In concealed spaces of stud walls, including furred spaces, at the ceiling and floor levels and at 10' intervals both vertical and horizontal.
    b. At all interconnections between concealed vertical and horizontal spaces such as at soffits, drop ceilings and cove ceilings.
    c. In concealed spaces between stair stringers at the top and bottom of the run and between studs along and in line with the run of the stairs if the walls under the stairs are unfinished.
    d. In openings around vents, pipes, ducts, chimneys, fireplaces and similar openings that afford a passage for fire at ceiling and floor levels.
    e. At openings between attic spaces and chimney chases for factory-built chimneys.

17. Draft stops shall be installed in floor-ceiling assemblies, attics, mansards, roof overhangs and similar concealed spaces of buildings of combustible construction. Such draft stops shall be in line with walls separating individual dwelling units [708.3.1.1.2, 708.3.1.2.1].

18. In fire-resistive exterior wall construction, the fire-resistive rating shall be maintained through attic or other concealed spaces [709.3.1].

19. Through penetrations of walls, where openings are required to be protected, shall comply with Section 709.6.2 or 709.6.3 [709.6.1].

20. Openings into a shaft enclosure shall be protected by a self-closing fire assembly conforming to Section 713 and having a fire-protection rating of one-hour for openings through one-hour fire-resistive walls and one and one-half hours for openings through two-hour fire-resistive walls [T-6A, 711.1, 711.4].
21. A minimum 0.019" (No 26 galvanized sheet gage) corrosion-resistant weep screed shall be provided at or below the foundation plate line on all exterior stud walls. The screed shall be placed a minimum of 4" above grade, or 2" above paved areas [2506.5].

22. Anchored veneers shall be supported on footings, foundations or other noncombustible support [1403.6].

23. Anchored veneer and its attachments shall be designed to resist a horizontal force equal to at least twice the weight of the veneer [1403.4.3].

24. Planter boxes installed adjacent to wood frame shall have a 2" wide air space between the planter and the building wall [2306.8].

25. Foundation walls enclosing a basement below finished grade shall be damp proofed by approved methods and material. [1402.4].

26. The aggregate area of all penthouses and other roof structures shall not exceed $33^{1/3}$% of the area of the supporting roof [1511.2].

27. No penthouse or any other projection above the roof shall be used for purposes other than shelter of mechanical equipment [1511.4].

28. A minimum attic access opening of 22"x 30" shall be provided to attics of buildings with combustible ceiling or roof construction. Opening shall be located in a corridor, hallway or other readily accessible location [1505.1].

29. Enclosed attics shall have cross ventilation for attic space by ventilating openings. The net ventilating area shall not be less than 1/150 of the area of the ventilated space [1505.3].

30. Roof drains shall be installed at each low point of the roof [1506.2].

31. Overflow drains having the same size as the roof drains shall be installed with the inlet flow line 2" above the low point of the roof. Overflow drains

shall not be connected to the roof drain lines [1506.3].

32. Elevator shaft(s) extending more than two floor levels shall be vented to the outside [3004].

33. Existing foundations that may be affected by excavations shall be protected against settlement and lateral movement. Before commencing the excavation, the person(s) making the excavation shall notify in writing the owners of the adjoining buildings not less than 10 days before excavation starts. Submit to B & S (prior to issuance of permit) evidence of adjoining property owner(s) written notification and provide plans for temporary shoring [3301.1, 3301.2].

INTERIOR ENVIRONMENT

1. Habitable rooms other than a kitchen shall have a minimum dimension of 7' in any direction and a floor area of 70 square feet [310.6.2, 310.6.3].

2. Habitable rooms shall have a ceiling height of 7' 6". Kitchens, halls, bathrooms may have a ceiling height of 7' 0" [310.6.1].

3. Basements and every sleeping room below the fourth story shall have at least one operable window or door approved for emergency escape. Emergency escape shall open directly into a public way, alley, and yard or exit court and shall be operable from the inside without the use of tools [310.4].

4. Escape or rescue windows shall have a minimum net clear operable area of 5.7' square feet, minimum net clear operable height of 24" and minimum net clear operable width 20" and have a sill height not more than 44" above the floor [310.4].

5. Light and ventilation courts shall not be less than 3' in width. Courts having openings on apposite sides shall not be less than 6' in width [1203.4.3].

6. Courts bounded on three or more sides shall not be less than 10' in length. For buildings more than two stories in height, the court shall be increased 1' in width and 2' in length for each story over two [1203.4.3].

7. Adequate access shall be provided to the bottom of all courts for cleaning purposes. Every court more than two stories in height shall be provided with a horizontal air intake at the bottom not less than of 10 square feet in area and leading to the exterior of the building [1203.4.3].

8. Habitable rooms shall be provided with natural light by means of exterior openings with an area not less than 1/10 of the floor area of such room with a minimum of 10 square feet [1203.2].

9. Habitable rooms shall be provided with natural ventilation by means of operable exterior openings with an area not less than 1/20 of floor area of such room with a minimum of 5 square feet [1203.2, 1203.3].

10. In lieu of required exterior openings for natural ventilation, a mechanical ventilating system may be provided. Such system shall be capable of providing two air changes per hour with a minimum of 15 cubic feet per minute [1203.3].

11. Parking garages (S-3 Occupancy) require a ventilation system. Clearly show on the plans how garage ventilation requirements are met [311.9.2.2, 1202.2.7].

SPECIAL HAZARD REQUIREMENTS

1. In each dwelling unit, a smoke alarm shall be installed in the following locations [310.9.1.4]:
   a. Each sleeping room
   b. Centrally located in hallways giving access to each sleeping room
   c. On each story of multistory dwelling and in basements
   d. In split-levels, detectors shall be installed on the upper level. If the lower level contains sleeping areas, then smoke alarms shall be installed on each level
   e. When sleeping areas are on the upper level, the alarm shall be located in close proximity to the stairway

2. Smoke alarms shall sound an alarm audible in all sleeping areas of the dwelling unit [310.9.1.4].

3. Hard-wired smoke alarms are required in existing R Occupancies when the valuation of an addition, alteration, or repair exceeds $1, 000 and a permit is required. Battery type alarms are not allowed and may not be used in lieu of hard-wired alarms [310.9.1.2, 310.9.1.3, 310.9.1.4 & 310.9.1.5].

4. R-1 Occupancy buildings over three stories in height or containing 15 or more dwelling units shall have a manual or automatic fire alarm system. A fire alarm and communication system shall be

provided in R-1 Occupancies located in a high-rise building [310.14.12.1].

5. Walls and soffits of enclosed space under interior stairs shall be protected on the enclosed side as required for one-hour fire-resistive construction [1003.3.3.9].
6. Enclosed usable space under stairway in an exit enclosure is not permitted [1005.3.3.6].

7. Storage or laundry rooms within apartment buildings that are used in common by tenants shall be separated from the rest of the building by not less than one-hour fire-resistive occupancy separation [310.2.2].

8. Rooms containing a boiler, central heating plant shall be separated from the rest of the building by not less than a one-hour fire-resistive occupancy separation [302.5].

9. Rubbish and linen chutes shall terminate in rooms separated from the remainder of the building by an occupancy separation having the same fire resistance as required for the shaft enclosure, but not less than one-hour. Openings into chutes and chute termination rooms shall not be located in corridors or stairways [711.5].

10. An automatic sprinkler system shall be installed at the top of rubbish and linen chutes and in their terminal rooms. Chutes extending through three or more floors shall have additional sprinkler heads installed within such chutes at alternate floors [904.2.2].

11. An automatic sprinkler system is required throughout every R-1 occupancy three or more stories in height or containing 5 or more dwelling units and in every hotel three or more stories in height or containing 6 or more guest rooms [904.2.9].

12. An automatic sprinkler system is required in every story or basement when the floor area exceeds 1,500 square feet and exterior openings are not provided [904.2.2].

13. An automatic sprinkler system is required throughout all buildings with a floor level with an occupant load of 30 or more that is located 55’ or more above the lowest level of fire department vehicle access [904.2.2].

14. Standpipes shall be provided in accordance with Table 9-A [904.5].

15. A mechanical or passive smoke-control system meeting the requirements of Section 905 is required in all high-rise buildings [403.3].

16. Openings in smoke-barriers shall be protected by self-closing devices or automatic-closing devices actuated by the required controls for the mechanical smoke-control system [905.2.4].

17. The smoke-control system shall be supplied with two sources of power. Primary power from the normal building power system and a secondary power from an approved standby power source [905.8.1].

18. The standby power source and its transfer switches shall be in a separate room from the normal power transformers and switchgear and shall be enclosed in a room of not less than one-hour fir-resistive construction. Power distribution from the two sources shall be by independent routes [905.8.1].

19. For the purpose of glazing, the following locations are considered hazardous locations [2406.4]:
    a. Glazing in ingress and egress doors.
    b. Glazing in fixed and sliding panels of sliding doors and panels in swinging doors (other than wardrobe doors).
    c. Glazing in doors and enclosures for hot tubs, bathtubs, showers, steam rooms within 5’ of standing surface and drain inlet
    d. Glazing within 2’ vertical edge of closed door and within 5’ of walking surface
    e. Glazing in railings and stair landings
    f. Glazing in walls and fences used as the barrier for swimming pools and spas

MEANS OF EGRESS

1. Exit signs shall clearly identify the path of exit travel [1003.2.8.2].

2. Exit signs shall be internally or externally illuminated [1003.2.8.4].

3. Every required exit doorway serving an occupant load of 10 or more shall not be less than 3’-0” wide x 6’-8” high [1003.3.1.3].

4. Regardless of the occupant load served, there shall be a level landing on each side of the door [1003.3.1.6].

5. Landings shall have a width no less than the width of the door or the stair served (whichever is greater). Doors the fully open shall not reduce the width of the landing by more than 7" [1003.3.1.7].

6. Exit doors shall be operable from the inside without the use of a key or special knowledge [1003.3.1.8].

7. Double acting doors shall not be used as exits where any of the following conditions exist [1003.3.1.5]:
   a. The occupant load served by the door is 100 or more.
   b. The door is part of a fire assembly.
   c. The door is part of a smoke-and draft-control assembly.
   d. Panic hardware is required or provided on the door.

8. Stairways shall meet the following requirements:
   a. Minimum 11" run and maximum 7" rise. The largest rise or run in a flight of stairs may not exceed the smallest by more than 3/8" [1003.3.3.3].
   b. Minimum 6'8" headroom clearance at treads nosing [1003.3.3.4].
   c. Provide a floor or landing at the top and bottom of each stairway.
   d. Handrails for the length of the stairs (required for 4 or more risers). The top of the handrail shall be placed not less than 34" or more than 38" above the tread nosing [1003.3.3.6].
   e. Minimum of 44" in clear width [1003.3.3.2].
   f. Handgrip portion o handrail shall not be less than 1-1/4" or more than 2" in cross-sectional dimension having a smooth surface with no sharp corners [1003.3.3.6].
   g. A positive stair connection to the structure primary structure [2320.13].

9. Circular stairs shall maintain a minimum width of run of not less than 10" and the smaller stairway radius shall not be less than twice the width of the stairway [1003.3.8.1].

10. Winding stairways may be used within a unit if the required width of the run is provided at a point not more than 12" from the side where the treads are the narrower, but in no case shall the run width be less than 6" at any point [1003.3.3.3.8.3].

11. Spiral stairways may be used within a unit of an R-1 building if the area served does not exceed 400 square feet [1003.3.3.8.3].

12. Ramps in a means of egress system shall have a width of not less than 44" [1003.3.4.2].

13. The slope of ramps within an accessible route shall not be steeper than 8.3%. The slope of other ramps shall not be steeper than 12.5% [1003.3.4.3].

14. Ramps having slopes steeper than 5% shall have handrails as required for stairways [1003.3.4.5].

15. All openings in the exterior wall below and within 10 feet, measured horizontally, of openings in an interior exit stairway serving a building over two stories in height or a floor level having such openings in two or more floors below, shall be protected by fixed or self-closing fire assemblies having a three-fourths-hour fire rating [1003.3.3.10].

16. In buildings four or more stories in height, one stairway shall extend to the roof surface [1003.3.3.11].

17. All required interior stairways that extend to the top floor in any building four or more stories in height shall have, at the highest point of the stair shaft, an operable approved hatch of not less than 16 square feet in area [1003.3.3.12].

18. Stairway identification signs shall be located at each floor level in all enclosed stairways in buildings four or more stories in height [1003.3.3.13].

19. Tactile stair level identification signs that comply with 1117B.5.1 shall be located at each floor level landing in all enclosed stairways in buildings two or more stories in height [1003.3.3.13.1].

Exit Access

1. Hallways and interior courts shall be considered as intervening rooms [1004.2.2].

2. Every occupant in basements and on stories other than the first story shall have access to not less than two exits [1004.2.3.2].

3. Where the third floor within an individual unit does not exceed 500 square feet, access to only one exit need be provided from that floor [1004.2.3.2].

4. Access to not less than three exits shall be provided when the individual or cumulative

occupant load served is 501 to 1,000 [1004.2.3.4].

5. Where two or more exits are required from any portion of the building, at least two exits shall be placed a distance apart equal to not less than 0ne half of the length of the maximum overall diagonal dimension of the area served [1004.2.4].

6. Hallways shall have a minimum width of 44" when serving an occupant load of 50 or greater [1004.3.3.2].

7. Hallways in R-1 Occupancies serving an occupant load of 10 or more shall comply with the requirements of Section 1004.3.4 for corridors [1004.3.3.5].

8. Corridors shall have a minimum width of 44" when serving an occupant load of 50 or greater [1007.6.1].

9. The walls and ceiling of corridors shall be constructed of fire-resistive materials [1004.3.4.3.1].

10. Tight fitting smoke-and draft-control assemblies having a fire-protection rating of not less than 20 minutes shall protect all exit-access doorways to a corridor [1004.3.4.3.2.1].

11. Windows in corridor walls shall be protected by fixed glazing of at least three-fourths hour fire-protection rating [1004.3.4.3.2.2].

12. Elevators opening into a corridor shall be provided with an elevator lobby at each floor containing such a corridor. Elevator lobbies shall comply with the requirements of Section 3002 [1004.3.4.5].

13. Where smoke-and fire-dampers are required by Sections 713.10 and 713.11, combination fire/smoke dampers shall be provided for duct openings in corridors, [1004.3.4.3.2.3].

Exits

1. Intervening room shall not interrupt exits [1005.2.3].

2. Once a given level of fire-resistive protection is achieved in an exit component, the fire resistive time-period of such component shall not be reduced until arrival at the exit discharge or the public way [1005.3.1].

3. Exit enclosures shall be of fire-resistive construction as follows [1005.3.3.2]:
   a. Exit enclosure shall not be less than one-hour fire-resistive construction in buildings other than Type I or Type II-F.R. construction and less than four stories in height.
   b. Exit enclosure shall not be less two-hour fire-resistive construction in buildings of Type I or Type II-F.R. construction of any height.
   c. In buildings of any type of construction and four or more stories in height, exit enclosures shall not be less than two-hour fir-resistive construction

4. Exit enclosures in buildings of Type I or II construction, shall be of noncombustible construction [1005.3.3.2].

5. Exit enclosures shall exit directly to the exterior of the building or exit passageway [1005.3.3.3].

6. A stairway in an exit enclosure shall not continue below the grade level exit unless an approved barrier is provided at the ground-floor level [1005.3.3.4].

7. Openings in exit enclosures shall be limited to those necessary for egress from normally occupied spaces into the enclosure and those necessary for egress from the enclosure [1005.3.3.5].

8. There shall not be enclosed usable space under stairways in an exit enclosure [1005.3.3.6].

9. In buildings having a floor level used for human occupancy more than 75' above the lowest level of fire department vehicle access, all required exit enclosures shall be pressurized per Section 905 [1005.3.3.7].

10. Pressurized exit enclosures shall be provided with a pressurized entrance vestibule [1005.3.3.7.1].

11. Exit passageways less than 400' in length shall have walls, floors and ceilings of not less than one-hour fire-resistive construction [1005.3.4.3].

12. Openings into exit passageways shall be limited to those necessary for egress from normally occupied spaces into the exit passageway and hose necessary for egress from the exit passageway. Elevators shall not open into an exit passageway [1005.3.4.4].

13. Interior exit doors in an exit passageway shall be protected by a fire assembly having a fire-protection rating of one-hour in a one-hour exit passageway and one and one-half in a two-hour exit passageway [1005.3.4.4].

Exit Discharge

1. Exterior stairs, exterior exit balconies and exterior exit ramps are not permitted in areas where building openings are prohibited or required to be protected by Table 5-A [1006.2.1].

2. Exterior exit balconies shall have a width of 44" minimum when serving an occupant load of 50 or greater [1006.3.2.2].

3. Walls of exterior exit balconies serving a Group R-1 Occupancy having an occupant load of 10 or more shall not be less one-hour fire-resistive construction [1006.3.2.3].

4. There shall be no enclosed usable space under exterior exit stairways [1006.3.3.2].

5. All openings in the exterior wall below and within 10' measured horizontally, of an exterior exit stairway serving a building over two stories in height or a floor level having such openings in two or more floors below shall be protected by fixed or self-closing fire assemblies having a three-hour fire-protection rating [1006.3.3.3].

6. Exit courts shall have a width as required by Section 1003.2.3 or a minimum of 44". The required width shall be unobstructed to a height of 7' [1006.3.5.2].

7. Where an exit court serving an occupant load of 10 or more is less than 10' in width, the exit court wall shall not be less than one-hour fire-resistive construction for a distance of 10' above the floor of the court, and all openings therein shall be protected by fixed self-closing fire assemblies having a ¾-hour fire-protection rating [1006.3.5.3].

    a. Exit courts serving an occupancy load of 10 or more shall have not less than one-hour fire resistive construction exit court walls for a height of 10 feet above the floor of the court when exit court is less than 10 feet in width [1006.3.5.3].
    b. Exit courts shall have a minimum width of 44" and an unobstructed height of 7' [1006.3.5.2].

8. Exterior stairs, exterior exit ramps are not permitted in areas where building openings are prohibited or required to be protected by Table 5-A [1006.2.1].

SPECIAL LOCAL REQUIREMENTS

Energy requirements

Separate energy plans and calculations shall be submitted for multi-family buildings with five units or more. Architectural plans for buildings with less than five units shall include the following:

1. For projects located north of the 405 Freeway; comply with California energy requirements for Climate Zone 8.

3. For projects located south of the 405 Freeway; comply with California energy requirements for Climate Zone 6.

4. Title 24 Energy calculations shall be submitted and applicable insulation, glazing U-factor; SHGC etc. shall be shown on the plans.

5. Energy envelope shall comply with the requirements for Package D or Alternative to Package D. Show insulation, U-factor, SHGC, etc. on the plans.

6. The completed CF-1R and MF-1R forms shall be attached to the plans.

7. The building type requires that a licensed architect or engineer take responsibility for the building design under the California Business and Professions Code, the responsible person shall sign the Certificate of Compliance as designer and shall indicate his or her license number above the signature. [Sec. 1403(a) 1, Title 20].

8. The following notes and information must be added to the plans if the completed CF-1R and MF-1R forms are not attached to the plans
    a. The following openings in the exterior envelope of the building shall be caulked or otherwise sealed to limit infiltration:
        i. Exterior joints around window and doorframes, between wall sole plates and floors and between exterior wall panels;
        ii. Openings for plumbing, electrical and gas lines in walls, ceilings and floors;
        iii. Openings in the attic, such as the point where ceilings meet masonry fireplaces.
    b. Exhaust fans shall be provided with back draft dampers or automatic dampers.

c. Ducts shall be constructed, installed and insulated according to Chapter 6 of the California Mechanical Code.
d. Thermostatically controlled heating and cooling systems, except electric heat pumps, shall have an automatic thermostat set points for at least two periods within 24 hours.
e. Heating, ventilating and air conditioning (HVAC) equipment shall be certified by California Energy Commission.
f. Water heaters shall be certified by the California Energy Commission
g. Wrap storage type water heaters and storage and backup tanks for solar water heater systems with minimum R-12 insulation exterior and R-16 for interior.
h. Piping in unconditioned space leading to and from water heaters shall be insulated with minimum R-4 insulation for a distance of 5 feet from the water heater.
i. General lighting in kitchen and bathrooms shall have an efficiency of at least 40 lumens per watt. Show lighting fixtures complying with this requirement on the plans.

9. Manufactured doors and windows shall be certified. And labeled in compliance with the appropriate infiltration standards.

10. Location of all double glazed windows shall be shown on the plans.

Storm Water Management

1. Plans shall include all required Standard Urban Storm water Mitigation Plans (SUSMP) mitigation features such as catch basins, filters etc.

2. A maintenance report of permanent Best Management Practices (BMP) shall be submitted to the City. The report shall outline ways to effectively minimize the negative impacts of construction activities on storm water quality.

3. Plans shall include a note that reads: "I have selected appropriate BMP to minimize the negative impact of the construction activity on storm water quality. The project owner and contractor are aware the selected BMP must be installed, monitored and maintained to ensure their effectiveness. The BMP not selected for implementation are redundant or deemed not applicable to this project".

4. Submit to the City proof of "Maintenance Agreement" recorded against the title of the property indicating:
   a. Compliance with applicable requirements of the BMP.
   b. A plan to ensure ongoing maintenance for permanent BMP.

   The Maintenance Agreement shall include a signed statement by the developer accepting responsibility for all structural and treatment control BMP maintenance until the time the property ownership is transferred.

5. The complete SUSMP requirements may be viewed in the City's website at *http://www.longbeach.gov/apps/city clerk/lbmc/title-18/frame.htm* and scrolling down to Chapter 18.95

Flood Hazard Zone

1. Projects located in a Flood Hazard Zone require that a Flood Elevation Certificate (FEC) be obtained from the Public Works Department, 10th floor of City Hall [LBMC 21.62].

2. Plans shall indicate the finish floor elevation of the lowest floor including the basement is above the Base Flood Elevation (BFE) as indicated on the FEC form. Specify the finish floor elevation of the lowest floor on the plans.

3. A preliminary FEC executed by a licensed surveyor shall be submitted to the building inspector prior to raised floor sheathing or concrete slab on grade inspection.

4. A final FEC executed by a licensed surveyor must be furnished to the City prior to a Temporary Certificate of Occupancy.

5. Mechanical, electrical, plumbing service systems shall be located above the Base Flood Elevation (BFE) or plans shall clearly indicated how system components are protected during flooding.

Earthquake Fault Zone

1. Projects located in the Alquist/Priolo Special Studies Earthquake Fault Zone require the submittal of 3 copies of a geological report for review and approval. Building improvements with a valuation of less than 50% of the replacement cost of the building are exempt.

2. Projects located in a Seismic Hazard Zone as defined by the California State Geologist require

the submittal of 2 copies of a soil/geological report prepared by a California licensed civil or geotechnical engineer having competence in the field of liquefaction evaluation and mitigating measures. Exception additions an/or alterations not exceeding 50% of either the value or square footage of the existing structure.

3. The report shall indicate that the site is not subject to liquefaction or shall recommend detailed mitigating measures.

4. Construction drawings shall show proposed mitigating measures.

Methane Zone

1. Soil report for the project shall include evaluation of methane gas presence on the site.

2. Permits shall not be issued for projects within 1,000 feet of fills containing rubbish or other decomposable material unless the fill is isolated by approved natural or manmade protective systems or unless designed according to the recommendations contained in a report prepared by a licensed civil engineer [LBMC 18.12.053].

3. All buildings located in a Methane Hazard Zone shall comply wit the City's Methane Mitigation Standard Policy.

4. When methane gas intrusion is found, the soil report shall include:
   a. Proposed site tests to determine the concentration and pressure of subsurface methane gas.
   b. Recommended system to mitigate gas intrusion.

5. Site testing shall be conducted under the supervision of a licensed Architect, registered Engineer or Geologist.

STRUCTURAL PLANS

1. The final set of structural plans must be signed by an engineer or architect licensed by the State of California. Plans for elements of the structure designed by others must be reviewed and signed by engineer or architect of record [106.3.2].

2. Plans shall include complete material specifications [106.3.2]:
   a. Plywood diaphragms: PS 1-95, Douglas Fir Larch, Structural 1 (or CDX)
   b. Particleboard: ANSI A208.1-1989. Moisture protection is required.
   c. Wood framing members: Grade and species of all lumber.
   d. Glue Lam Beams: Identify grade symbol and lamination species per T 5-A, '97 NDS Supp.
   e. Steel: Structural steel ASTM A36; Structural Pipe ASTM A53 Grade B; Tubing ASTM A501; Reinforcing bars ASTM A615
   f. Concrete: Standard 2,500-psi concrete and 3,000-psi min. for grade beams and caissons.

3. The first sheet of structural plans shall indicate:
   a. Type of construction, number of stories and building height
   b. Design dead and live loads for each floor and roof
   c. Seismic coefficients (Z, I, C, R, Na, Cp etc.)
   d. Basic wind speed, wind pressure coefficients (Ce, Cq, Iw etc.)
   e. Soil type and properties

4. Soils/Geotechnical report shall be submitted for this project [1804.3].

5. Complete shoring plans and material specifications shall be submitted for excavation or plans shall indicate cut slopes as recommended by the soils report. Before commencing the excavation, proof of notification to adjoining property owners shall be submitted. [3301.1, 3301.2]

6. Plans shall indicate the name, address, and phone number of the Project Geotechnical Consultant and a list all applicable reports and review responses.

7. Plans shall include the following note on all foundation sheets: ***"All foundation excavations must be observed and approved by the Project Geotechnical Consultant prior to placement of reinforcing steel"*** and ***"Excavations shall be made in compliance with CAL/OSHA regulations"***.

8. The final grading, drainage, shoring, and foundation plans must be reviewed, signed and wet stamped by the Project Geotechnical Consultant.

9. Structural observation is required. Provide complete notes on the plans and clearly indicate stages of construction and items where observation is required [LBMC 18.24.300, 1702].

10. Special inspection (by a certified inspector) is required for field welding, high strength bolting, sprayed on fire proofing, concrete with strength > 2500 psi, high-lift grouting, special moment-resisting frames, piles, drilled piers, caissons, epoxy anchors and shotcrete [1701.5].

11. When special inspection is required, provide general notes that designate:
    a. Portions of the work that require special inspection
    b. Names of individual(s) /firm(s) that will provide special inspection
    c. Duties of the special inspector(s), including time limits for submission of reports to the building official

12. Plans shall indicate foundation depth below undisturbed ground surface or engineered compacted fill per approved compaction soils report [1804.3, T-18-I-C].

13. Foundations on ground sloping more than 1 unit vertical in 10 units horizontal shall be level or shall be stepped so that top and bottom of such foundation are level [1806.4].

14. Individual pile caps and caissons of every structure subjected to seismic forces shall be interconnected by ties. Ties shall be capable of resisting, in tension or compression, a minimum horizontal force of 10% of the larger column vertical load [1807.2].

15. Show hold-down hardware location on foundation plan. Hold-down connectors shall be re-tightened just prior to enclosure [LBMC 18.24.470].

16. Foundation plans shall include the type, size, embedment, edge distance, and spacing of all anchor bolts. Minimum anchor bolt diameter of 5/8" with 7" embedment is required.

17. Plate washers are required for all anchor bolts [LBMC 18.24.510].

18. Foundation shall be extended a minimum of 6" above adjacent finish grade/surface [2306.8].

19. A minimum under-floor clearance of 12" for girders, and 18" for joists is required for untreated wood members above earth [2306.3].

20. Joists under and parallel to bearing partitions shall be doubled [2320.8.5].

21. The size, height and spacing of studs shall be in accordance with Table 23-IV-B or structural design shall be submitted [2320.11.1].

22. Structural plans shall include plywood thickness, grade, span rating of panel index, nailing schedule and panel layout for roof and floor diaphragms [T23-II-E-1, 2, T23-II-F-1].

23. Plans shall include design/details for trusses.

24. Positive connections at all post-beam connections to account for uplift forces and lateral displacements shall be provided [2314].

25. Studs supporting two floors and a roof must be framed of 3"x 4" or 2"x 6" members [T23-IV-B].

26. Exterior and interior wall bracing lines spaced at 25' on center maximum shall be provided in the longitudinal and transverse direction in each story [2320.5.1].

27. Studs in exterior walls and bearing partitions may be notched to a depth not to exceed 25% of their width. Holes mot greater than 40% of the stud width may be bored in any wood stud [2320.11.9, 2320.10].

28. Aspect ratio of plywood shear walls shall be limited to 2:1 [LBMC 18.24.440].

29. Plans shall include a shear wall schedule. Schedule shall indicate the maximum design shear load for each shear wall type. [T 23-II-I-1].

30. Nails for wood structural panel shear walls and diaphragms shall be "common" type nails with full heads. Additionally, nails shall be placed a minimum of ½" from the panel edges and a minimum of 3/8" from the edge of the connecting members for shear greater than 300 plf.

31. Shear walls with a shear value greater than 350 plf require the following [T 23-II-I-1]:
    a. 3 x foundation sill plates.
    b. 3 x framing members receiving edge nailing from abutting panels.
    c. Diaphragms and shear wall nailing shall utilize common or galvanized box nails.
    d. 1/2" edge distance for plywood boundary nailing.

32. Wood members shall not be used to permanently support masonry or concrete dead load [2307, LBMC 18.24.430].

33. Cantilevered diaphragms supporting floors or roofs above shall not exceed 15% of the distance between lines of lateral-load-resisting elements from which the diaphragm cantilevers [LBMC 18.24.440].

STRUCTURAL CALCULATIONS

1. Structural calculations for roof and floor truss systems shall be provided.

2. Exit facilities shall be designed for 100 pounds per square feet uniform live load. [T16-A].

3. Railings and its components (including glass railings) shall be designed to withstand minimum horizontal forces specified in Table 16-B. A safety factor of 4 shall be used [2406.6].

4. Balcony railings, guardrails, partitions and ceiling framing shall be designed to withstand the special load provisions specified in table 16-B.

5. Using allowable stress design loads, retaining walls shall be designed to resist 1.5 induced lateral load and overturning moment [1611.6].

6. Height/length ratio of horizontal diaphragm and shear wall shall be limited as set forth in Table 23-II-G. Where shear walls with openings are designed for force transfer around openings, the limitations of Table 23-II-G shall apply. Design of force transfer shall be based on a rational analysis [2315.1, LBMC 18.24.440].

7. Calculations and details for drag struts between shear walls and chord splices shall be provided.

8. When determining the maximum uplift force for hold-down design, multiply the dead load resisting moment by 0.9 for seismic forces or 2/3 DL for wind forces [1612.3.1, 1621.1].

9. Hold-down connectors shall be designed to resist shear wall overturning moments using approved cyclic load values or 75% of the allowable earthquake load values that do not consider cyclic loading of the product [2315.5.6, LBMC 18.24.470].

10. Cantilevered columns resisting seismic forces shall be designed with an R factor of 2.2 and shall be limited to a maximum drift of 0.025h [T 16-N, 1630.10.2].

11. The following earthquake loads shall be used in the load combinations set forth in Section 1612 [1630.1.1]:
$E = \rho E_h + E_v$
$E_m = \Omega E_h$

12. The resulting member forces and moments and the story drifts induced by $P\Delta$ effects shall be considered in the evaluation of overall structural frame stability and shall be evaluated using the forces producing the displacements of Δ_s [1630.1.3].

13. Cantilevered diaphragms supporting floors or roof shall not exceed 15% of the distance between lines of lateral-load resisting elements from which the diaphragm cantilevers. The depth to width ratio of the cantilevered diaphragm shall not be less than 4:1 [LBMC 18.24.440].

14. The design story shear should be distributed to various lateral-load-resisting elements in proportion to their rigidities. [1605.2.1]

15. Calculations to determine the flexibility of diaphragms and horizontal distribution of shear forces at each level shall be provided [1630.6].

16. The location of the center of rigidity and center of mass shall be identified by calculations. [1630.6].

17. Where diaphragms are not flexible, the assumed calculated center of mass at each level should be displaced 5% and increased shears resulting from the torsion should be addressed. [1630.6 and 1605.2.1].

18. Calculated story drift using Δ_M shall not exceed 0.025 times the story height for structures having a fundamental period of less than 0.5 second. For structures having a fundamental period of 0.5 second or greater, the calculated story drift shall not exceed $0.20/T_{1/3}$ [1630.10.2, LBMC 18.24.250].

19. Wood shear panels shall meet the story drift limitation of Section [1630.10.2] of the CBC. Deflections calculations according to UBC Standard 23-2 Section [23.223] shall be increased 25%. The calculated deflections shall include the contribution to the deflection from anchor or tie-down slippage. The slippage contribution shall include the vertical elongation of the metal, the vertical slippage of the fasteners and compression or shrinkage of the wood elements. The total vertical slippage shall be multiplied by the height-

to-width ratio of the shear wall and added to the total horizontal deflection [2315.5.7, LBMC 18.24.480].

20. Connections and anchorages capable of resisting the design forces shall be provided between the diaphragm and the resisting elements. Openings in diaphragms that materially affect their strength shall be fully designed [2315.1, LBMC 18.24.440].

21. Concrete, masonry, steel and wood elements supporting discontinuous lateral-load resisting systems shall be designed to resist the special load combinations per formulas (12-17) & (12-18) [1630.8.2].

22. The allowable non-cyclic shear values of Table 23-II-I-1shall be limited to 75% of values shown to account for stress losses due to seismic loads [LBMC 18.24.520].

23. Eccentric hold-down connections shall include effects of eccentric loads on boundary members of shear walls.

24. Use a near source factor Na of 1.3 in the determination of Ca (within 2 kilometers of a Type B fault).

25. Unless the terrain is flat and generally open, wind design within the City shall be based on exposure B requirements.

26. Wood studs and bearing partitions shall not support more than two floors and a roof unless an analysis satisfactory to the building official shows that the shrinkage of the wood framing will not have adverse effects on the structure, plumbing or mechanical system [2308].